

FACTS



Ministry
of the
Environment

Hon. Jim Bradley
Minister

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Deputy Minister

about pesticides

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ORDERS OF THE CLASS INSECTA

Listed below are the more important orders of insects, related to Pest Control.

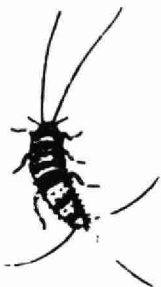
The Order name is followed by a literal translation of its derivation, and by common examples or the common name applied to the order as a whole.

For example: Coleoptera - (Sheath wing) the word being derived from "Coleos" meaning sheath and "Ptera" meaning wing. Beetles - the common name for members of this order.

Three general characteristics, wings, mouth parts and metamorphosis, are given for each order, and where necessary, additional features are mentioned.

SUBCLASS - APTERYGOTA (without wings; primitively wingless orders)

1. THYSANURA (bristle tail) silverfish, firebrats; 50 species in North America.



- a) primitively wingless (never had wings)
- b) chewing mouth parts
- c) without metamorphosis (ametabolous) egg - young - adult via several moults
- d) possess two long sensory devices (cerci) and sometimes a median caudal filament at end of abdomen
- e) long antennae
- f) feed on starchy material

2. COLLEMBOLA (glue peg) springtails, snowfleas; 320 species in North America



- a) primitively wingless (never had wings)
- b) chewing mouth parts
- c) without metamorphosis (ametabolous) egg - young - adult via several moults
- d) six abdominal segments
- e) possess a colophore on 1st abdominal segment
- f) possess a furcula on underside of 4th abdominal segment that catches on 3rd to give springing motion on release
- g) feed on decaying vegetation
- h) may enter homes during spring thaw



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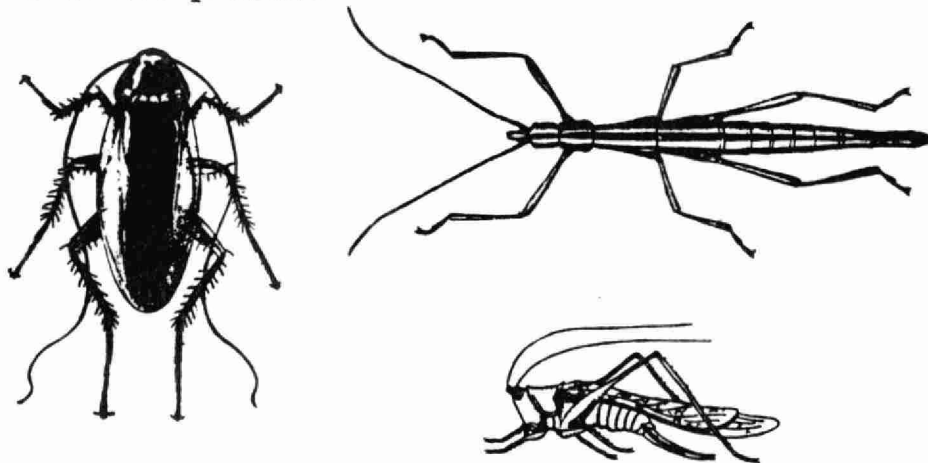
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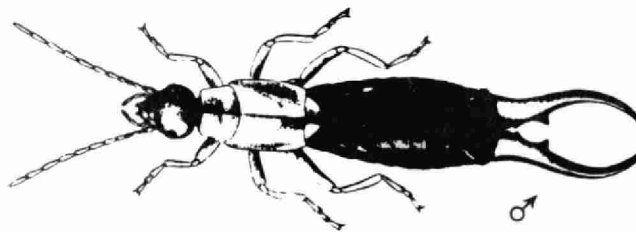
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SUBCLASS - PTERYGOTA (wing bearing - winged or with winged bearing ancestors)

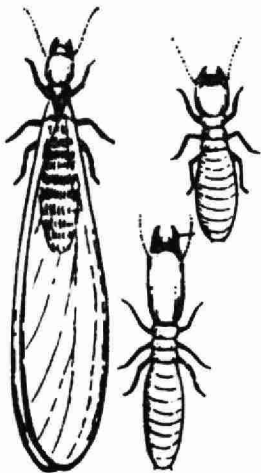
1. ORTHOPTERA (straight-wing) grasshoppers, crickets, cockroaches, mantids, walking sticks
- a) two pairs of unlike wings:-
Forewings: long and thickened (tegmina)
Hindwings: membranous, triangular and folded in pleats (fan-like)
 - b) chewing mouth parts
 - c) incomplete metamorphosis (paurometabolous) egg - nymph - adult
nymph feeds on same material as adult
 - d) cerci are present



2. DERMAPTERA (skin wing) earwigs; 18 species in North America
- a) two pairs of unlike wings: -
Forewings: short elytra meeting in straight line down back
Hindwings: membranous with radiating veins, folded length wise and cross wise under forewings
 - b) chewing mouth parts
 - c) incomplete metamorphosis (paurometabolous) eggs - nymph - adult
 - d) forcep-like cerci used in mating and feeding
 - e) show some parental care for the young



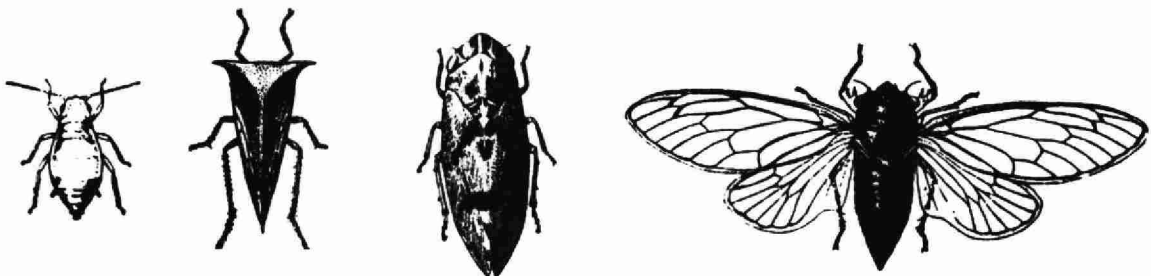
3. ISOPTERA (even wing) termites; 40 species in North America
- a) two pairs long similarly sized and shaped membranous wings, on primary reproductive caste only
 - b) chewing mouth parts
 - c) incomplete metamorphosis (paurometabolous)
 - d) abdomen broadly jointed to thorax
 - e) social insects
 - primary reproductive caste (King and Queen)
 - secondary reproductive caste (sexually mature wingless - adults)
 - soldiers - blind
 - workers - blind
 - f) symbiotic relationship with protozoa which convert cellulose to protein in gut of temite



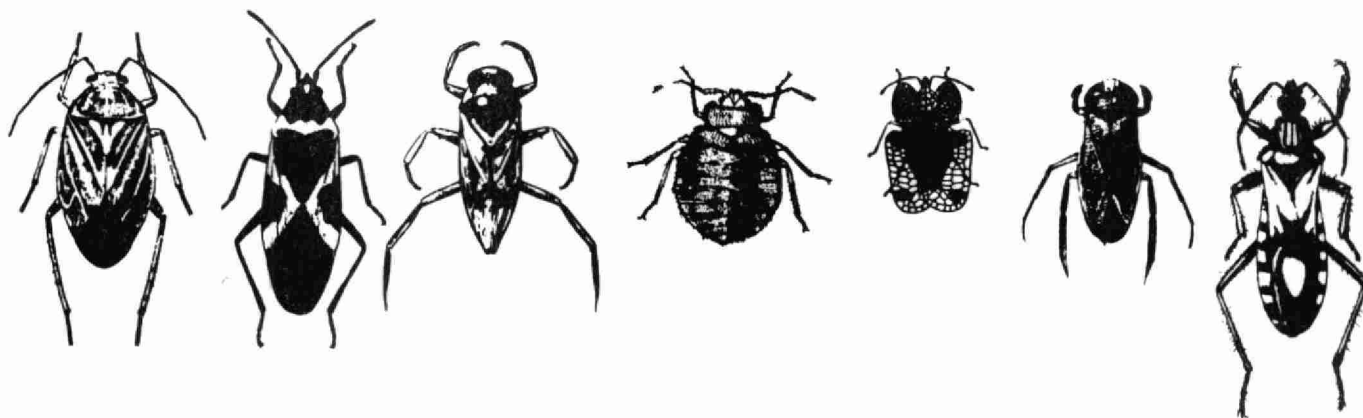
4. THYSANOPTERA (bristle wing) thrips; 600 species in North America
- a) membranous wings with long hairs (fringed)
 - b) rasping and sucking mouth parts
 - c) incomplete metamorphosis (paurometabolous)
 - d) herbivores, transmit plant diseases



5. HOMOPTERA (same wing) aphids, leafhoppers, cicadas; 5,700 species in North America
- a) two pairs similar membranous wings usually held roof-like over the back
 - b) sucking mouth parts arising from posterior underside of head
 - c) incomplete metamorphosis (in most cases) (paurometabolous)
egg - nymph - adult



6. HEMIPTERA (half wing) true bugs; 4,500 species in North America
- two pair of unlike wings: -
Forewings: half leathery, half membranous with membranous parts overlapping
Hindwings: membranous
 - sucking mouth parts arising from anterior underside of head
 - incomplete metamorphosis (paurometabolous) egg - nymph - adult



7. ANOPLURA (unarmed tail) sucking lice; 600 species in North America
- wingless - acquired condition due to parasitic life
 - sucking mouth parts
 - incomplete metamorphosis (paurometabolous) egg - nymph - adult
 - clinging legs
 - temperature dependent and host specific
 - entire life cycle on or near host. Eggs called nits



8. PSOCOPTERA (rub small wings) book and bark lice
- feed on mold and fungi in damp cellulose material, e.g. books
 - wingless in most stages
 - incomplete metamorphosis (paurometabolous)
 - non-parasitic



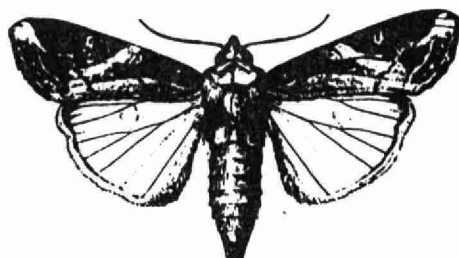
9. COLEOPTERA (sheath wing) beetles; 26,500 species in North America



- a) two pairs unlike wings: -
Forewings: elytra meeting in straight line down the back
Hindwings: membranous, folded under fore wings
- b) chewing mouth parts - some larvae have sucking mouth parts
- c) complete metamorphosis (holometabolous) egg - larva - pupa - adult
- d) no cerci, but larva have setae (hairs)

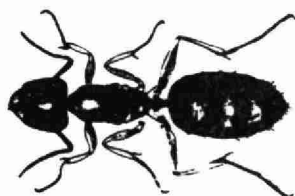
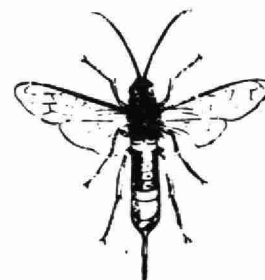
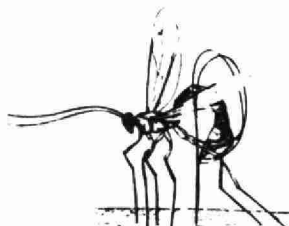
10. LEPIDOPTERA (scale wing) moths, butterflies; 10,300 species in North America

- a) two pairs of membranous wings usually covered in small scales
- b) sucking mouth parts coiled under head
chewing mouth parts in larva - thus species that infest food products are more destructive in this stage
- c) complete metamorphosis (holometabolous) egg - larva - pupa - adult

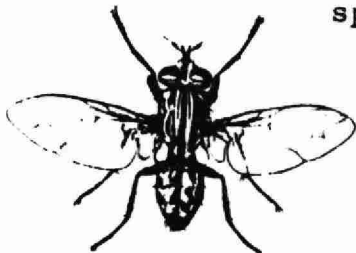


11. HYMENOPTERA (membrane wing) bees, wasps, hornets, ants, saw-flies; 15,300 species in North America

- a) two pairs membranous wings with reduced venation; hind wings smaller
- b) chewing or chewing/lapping mouth parts
- c) complete metamorphosis (holometabolous) egg - larva - pupa - adult
- d) female with piercing ovipositor or stinger; many are social insects, some are parasitic on other insects



12. DIPTERA (two wings) flies, mosquitoes, crane flies; 16,300 species in North America



- a) one pair membranous wings
second pair reduced to balancing organs (halteres)
- b) sucking mouth parts (variations: piercing; lapping; non-functional)
- c) complete metamorphosis (holometabolous) egg - larva - pupa - adult

13. SIPHONOPTERA (tube without wings) fleas; 238 species in North America

- a) wingless - acquired condition due to parasitic life
- b) piercing and sucking mouth parts
complete metamorphosis (holometabolous) egg - larva - pupa - adult
- c) laterally compressed body
- d) eggs, larva and adult are in nesting material of host. In homes, cat fleas, for example, may be found in carpeting and/or furniture, i.e., areas where the host is frequently present. Adults take blood meals from the host then jump off. Larvae feed on blood flecks (adult droppings) and/or skin and hair debris from the host.
- e) transmit many diseases due to this type of life cycle

